

NEW SYNONYMY, NEW SPECIES, AND TAXONOMIC NOTES  
OF NORTH AMERICAN *PITYOPHTHORUS*  
(COLEOPTERA: SCOLYTIDAE), PART III

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ABSTRACT.—New synonymies and new data affecting North American *Pityophthorus* are proposed as follows: *chalcoensis* Hopkins (= *herrerai* Hopkins) and *nigricans* Blandford (= *chiapensis* Bright). Neotypes are designated for the following species described by Eichhoff: *centralis*, *cribripennis*, *infans*, *puchellus*, and *tuberculatus*. New species are: *carinatus* (Canada), *cavatus* (Manitoba, Saskatchewan), *euterpes* (Mexico), *hesperius* (British Columbia), *impexus* (Mexico), *intentus* (Arizona), *laticeps* (Mexico), *malleatus* (Arizona), *mesembria* (Guatemala), *montezumae* (Mexico), *scalptus* (British Columbia, Colorado), *trepidus* (California), and *vespertinus* (Mexico).

This is the third paper under this general title wherein various new taxonomic data affecting the classification of the North American *Pityophthorus* are proposed.

A taxonomic monograph of North American *Pityophthorus* is being prepared, but the data contained herein is needed for other works in preparation. It was therefore decided to publish these data now in order that they may be used without delay.

The collections where type material is located are abbreviated as follows: British Museum (Natural History), London (BMNH); Canadian National Collection of Insects, Ottawa (CNC); Karl E. Schedl collection, Lienz, Austria (KESC); S. L. Wood collection, Provo, Utah (SLWC), and United States National Museum of Natural History, Washington, D.C. (USNM).

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*Pityophthorus chalcoensis* Hopkins

*Pityophthorus chalcoensis* Hopkins, 1905, p. 73 (Holotype ♀, Mexico, USNM)

*Pityophthorus herrerai* Hopkins, 1905, p. 74 (Holotype ♀, Mexico, USNM). *New synonymy*

This species, and its synonym *herrerai*, until recently have remained unknown since their description. References to neither name were found except for listings of the names in catalogs.

When reading the descriptions of the two species, it seems obvious that two distinct entities are present. *P. chalcoensis* is described as having the second declivital interspace deeply impressed and the first and third declivital interspaces with distinct granules. *P. herrerai* is described as having the second declivital interspace flat, the first declivital interspace with a few irregular granules and the third without distinct granules. With just four specimens of the combined type series of both species to examine, these distinctions can be seen. However, a short series of specimens referred to this species from Hidalgo, Mexico, has also been examined. One female in this series is identical to the female holotype of *chalcoensis*, one male is identical to the male paratype of *herrerai* and another female is very close to the female paratype of *herrerai*. It seems, therefore, that the differences noted by Hopkins are only variations in the species and only one name should be recognized.

The frons of adults of both sexes is almost identical. Both are very broadly flattened and densely pubescent. The only sexual distinction I could detect is the presence of a

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slightly elevated, impunctate callus at the midpoint of the upper margin of the male frons. Unfortunately, this callus is almost always concealed by the anterior margin of the pronotum and is only visible if the head is fully extended or if the anterior margin of the pronotum is broken away. In addition, adults may be recognized by the lack of a pronotal summit, by the densely punctured posterior portion of the pronotum, by the large stria punctures which form irregular stria rows, and by the steep, bisulcate elytral declivity which usually bears prominent granules on interspaces 1 and 3.

### *Pityophthorus nigricans* Blandford

*Pityophthorus nigricans* Blandford, 1904, p. 236 (Lectotype ♂, Guatemala, BMNH)

*Pityophthorus chiapensis* Bright, 1977, p. 522 (Holotype ♀, Mexico, CNC). *New synonymy*

The type material of *P. chiapensis* was compared to my homotypes of *P. nigricans* and found to represent the same species. The association of these two names was not apparent until the species described as *P. lepidus* Bright was recognized. A series of *P. lepidus* was previously considered to be *P. nigricans* and is therefore quite different from specimens subsequently described as *P. chiapensis*. At the suggestion of S. L. Wood, the specimens under all the above names were reexamined with the result that *P. chiapensis* must be merged with *P. nigricans*.

### NEOTYPE DESIGNATIONS

W. J. Eichhoff, over a period of years between 1868–1878, described a number of species of North American *Pityophthorus*. No original type specimens have been found despite the considerable correspondence with European museums where the types might have been housed. Presumably the specimens were in the Hamburg Museum (where other Eichhoff types were held) when the museum was destroyed during World War II.

Hans Eggers, a noted authority on the Scolytidae, had the opportunity in 1927 of comparing a number of North American species with the types in European museums. The specimens Eggers compared with the types are in the United States Mu-

seum of Natural History in Washington, D.C. Compared specimens representing five of Eichhoff's North American *Pityophthorus* have been located. These are listed below, along with notes concerning one additional species. Neotypes are now designated for all of Eichhoff's species of North American *Pityophthorus* except *P. bisulcatus*.

*P. centralis*, 1878, p. 188. No specimens bearing Eggers's "compared to type" label have been located. There is a series of four specimens in the USNM that were examined by Eggers and the first of these bears the label "nicht *Pityophthorus centralis* Eichh., Eggers 1927." However, Eichhoff himself identified some specimens in 1892 that had been collected in Florida by Hubbard and Schwarz. Eichhoff, in Eichhoff and Schwarz (1895), states "*P. centralis* from Florida is correctly determined and does not differ in the least from my typical specimen from Cuba..." The specimens sent to Eggers in 1927 were from the same series that was seen by Eichhoff in 1892. Obviously, either Eichhoff or Eggers made a mistake and I am inclined to follow the opinion of Eichhoff, the original describer of *P. centralis*. Therefore regardless of Eggers's label, in the interest of stability of nomenclature, I designate the first specimen in the USNM series seen by Eggers as the NEOTYPE. It bears the data: "Biscayne, Fla., 29.5"/"Coll. Hubbard and Schwarz"/"9" (on a white square)/"nicht *Pityophthorus centralis* Eichh." (in Eggers's handwriting), Eggers 1927/"NEOTYPE *Pityophthorus centralis* Eichh., D. E. Bright 1977."

*P. cribripennis*, 1869, p. 274. Neotype here designated, bears the data: "Ripley, Mississippi, 4-21-20"/"M.W. Blackman, collector"/"N.Y.S.C.F. Lot Mi 261"/"Pityophthorus cribripennis Eichh. mit type in coll. Eichhoff verglichen" (in Eggers's handwriting)/"NEOTYPE *Pityophthorus cribripennis* Eichhoff. D. E. Bright 1977." Synonym of *P. pullus* Zimmerman.

*P. infans*, 1872, p. 135. Neotype, here designated, bears the labels: "Syracuse, N.Y., 5-14-18"/"M.W. Blackman, collector"/"N.Y.S.C.F. Lot 1138"/"compared with type of *P. infans* Eichh. by H. Eggers. Five specimens, all typical" (large red label,

handwriting unknown)/"NEOTYPE *Pityophthorus infans* Eichhoff, D. E. Bright 1977." Synonym of *P. puberulus* Le Conte.

*P. pulchellus*, 1869, p. 275. Neotype (♀), here designated, is labeled: "Marquette, Mich"/"Coll. Hubbard and Schwarz"/"♀"/"13"/"Pityophthorus pulchellus Eichh., m. type in coll. Eichhoff verglichen" (in Eggers's handwriting)/ "NEOTYPE *Pityophthorus pulchellus* Eichhoff, D. E. Bright, 1977."

*P. tuberculatus*, 1878, p. 498. Neotype (♂), here designated, bears the data: "Hopk. U.S. 471a"/"Black Hills, S.D., Hopkins Colr."/ "Pityophthorus tuberculatus Eichh., m. type in coll. Eichhoff verglichen" (in Eggers's handwriting)/"5"/"NEOTYPE *Pityophthorus tuberculatus* Eichhoff, D. E. Bright, 1977.")

#### NEW SPECIES

##### *Pityophthorus carinatus*, n.sp.

Length 1.9–2.2 mm, 3.0 times longer than wide.

FEMALE.—Frons moderately concave on each side of a very strongly elevated, longitudinal carina, this carina sharp to moderately broad on summit, sometimes bearing short setae along summit, the carina usually more strongly elevated on epistomal area and extending to upper level of eyes; concave areas extending laterally nearly to eyes, surface moderately shining near eye, weakly and very finely punctured; an oval patch of extremely short setae forms a "spongy" patch in midarea, this patch extending upward on slopes of elevated carina to summit. Antennal club oval, 1.2–1.3 times longer than wide, widest through segment 2; sutures 1 and 2 weakly arcuate, 2 more strongly so; segments 1 and 2 occupy more than half the total club length.

Pronotum about 1.2 times longer than wide, widest at level of summit; sides sub-

parallel on posterior half; anterior margin broadly rounded, with about a dozen small, basally contiguous serrations; asperities on anterior slope low, small, usually isolated, scattered in no apparent order; summit distinct, high, with transverse impression distinctly indicated; posterior area distinctly punctured, the punctures rather small and shallow, separated by a distance equal to or less than their diameters; interpuncture surface moderately shining and rather densely, minutely reticulate; median line narrow, sometimes weakly elevated on anterior half or less.

Elytra about 1.8 times longer than wide; apex broadly rounded; striae and interstriae with numerous, intermixed punctures, making discernment of striae difficult, but striae are discernible because stria punctures are more numerous and arranged in a regular row, the punctures about equal in size and depth to those on posterior portion of pronotum. Declivity deeply impressed; interspace 1 weakly, narrowly elevated, deeply impressed below level of interspace 3; interspace 2 slightly widened, distinctly sulcate, the lateral portions raising abruptly toward interspace 3; interspace 3 distinctly elevated, much higher than 1, bearing a row of fine granules on summit; punctures in striae 1 and 2 obsolete.

MALE.—Frons flattened from eye to eye and from epistoma to upper level of eyes, divided by a strongly elevated, laterally flattened longitudinal carina, this carina more strongly elevated on lower portion on epistomal region; surface of flattened area strongly punctured, the punctures rather long and deep. Pronotum and elytra as in female. Declivity convex; lateral protuberances strongly to weakly elevated, strongly turned or pushed inward toward suture.

This species occurs in two distinct populations, which are designated as subspecies.

1. Summit of longitudinal, median elevation on female frons sharp, usually devoid of setae; protuberances on male declivity strongly elevated, blunt, extending inward over suture; occurs in NE United States and E Canada ..... *P. carinatus carinatus*, n. subsp.
- Summit of median elevation on female frons broad, with short setae; protuberances on male declivity not strongly elevated, pushed inward toward suture; occurs in British Columbia and Alberta ..... *P. carinatus monticolae*, n. subsp.



TYPE MATERIAL.—*P. carinatus carinatus*, n. subsp. Holotype (♀), U.S., New York, Sevey, 8-VIII-1970, D. E. Bright/on *Picea*/♀/HOLOTYPE *Pityophthorus carinatus carinatus*, D. E. Bright, 1977, CNC No. 15489. Allotype and two paratypes with same data. Nine paratypes are labeled: 64-1340-01, Ex. branch white pine/2 mi. E. of Jemseg, Queen's Co., N.B. 21 May 1965 F.I.S. Paratypes are in the CNC and the SLWC.

*P. carinatus monticolae*, n. subsp. Holotype (♀) is labeled: No. 70-569-01, Date II.VI-1970, F.I.S./*P. contorta*, Hazelton, B.C./♀/HOLOTYPE *Pityophthorus carinatus monticolae* D. E. Bright, CNC No. 15490. Two paratypes bear the same data. Allotype and three paratypes are labeled: Edmonton, Alta., 5-VII-1924/A. T. McClay collection. All type material is in the CNC.

REMARKS.—This species represents a very distinctive form that is easily recognized by the very strongly elevated, median carina on the female frons. The area on each side of the median carina is moderately concave and "spongy" on the inner portions and on the carina. In the eastern population the carina is very sharp along the summit and usually not pubescent, while in the western population the carina is broader and pubescent on the summit.

The male declivity of the eastern population resembles that of *P. cariniceps* LeConte, but is more variable in the western series.

This species probably is related to *P. cariniceps* and could conceivably represent an extreme variation of that species. However, no intergrades between *P. carinatus* and *P. cariniceps* have been seen and the size difference seems consistent.

*Pityophthorus cavatus*, n.sp.

Length 1.9–2.3 mm, 3.0 times longer than wide.

FEMALE.—Frons deeply concave in central area, concavity fringed by a dense brush of erect, coarse setae, central portion of concavity glabrous but may also bear densely placed, erect setae, these setae usually equal in length to those on periphery; an obscure to distinct, laterally flattened,

acute tooth is usually present on midpoint of epistoma; surface above and lateral to concavity deeply punctured, the punctures large, close, space between punctures shining. Antennal club nearly round, about as long as wide; suture 1 transverse or very weakly arcuate, 2 more strongly arcuate; segments 1 and 2 occupy more than half the total club length.

Pronotum about 1.3 times longer than wide; sides weakly arcuate; anterior margin broadly rounded, bearing about 10 erect, generally isolated serrations; asperities on anterior slope erect, of moderate size, and scattered in no apparent order; summit distinct; transverse depression behind summit distinct; posterior portion densely punctured, the punctures rather large, deep, and close; interpuncture space moderately shining, reticulate; median line narrow, impunctate.

Elytra about 1.8 times longer than wide; apex broadly rounded; discal striae and interstriae punctured in regular rows, making discernment of striae or interstriae difficult, strial punctures more numerous and each bears a very short seta, interstitial punctures much less numerous and each bears a longer erect seta; surface of interspaces shining, with numerous fine lines or very faintly reticulate. Declivity convex, bisulcate; interspace 1 weakly elevated, impressed below level of 3, devoid of granules; interspace 2 weakly sulcate, slightly wider than discal width, surface as on disc; interspace 3 weakly elevated, higher than 1, bearing a median row of 2–4 small, rounded granules; punctures in striae 1 and 2 obsolete.

MALE.—Only two male specimens of this species are known, and each differs considerably from the other in the characters of the declivity.

Variety 1. Frons flattened from upper level of eyes to epistoma, divided by a strongly elevated longitudinal carina, highest at epistoma and slanting downward on upper areas. Pronotum as on female. Elytra as on female except interstitial punctures more numerous and setae slightly longer. Declivity almost evenly convex, with a median, elongate rounded elevation that appears to arise in interspace 2 and is slightly bent inward over interspace 1; interspace 3

not elevated or granulate; surface of declivity moderately shining, minutely reticulate with weak stria punctures.

*Variety 2.* Frons distinctly impressed from epistoma to near upper level of eyes, divided by a strongly elevated, laterally flattened, toothlike carina; generally similar to variety 1. Pronotum and elytra as in variety 1. Declivity convex; interspace 1 weakly impressed, devoid of granules; interspace 2 weakly sulcate; interspace 3 bearing a large, rounded protuberance in middle of declivity, this protuberance directed caudad, inner slope precipitous, outer slope oblique; surface of declivity as in variety 1.

**TYPE MATERIAL.**—The holotype (♀) and four paratypes were collected at Canoe Lake, Saskatchewan, on 21 July 1972, from branches of *Pinus banksiana*, by D. E. Bright (CNC No. 15492). Six additional paratypes were collected at Charlottetown, Manitoba, on 13 August 1954, from branches of red pine.

The holotype and most of the paratypes are in the CNC. Additional paratypes are in the SLWC.

**REMARKS.**—This is a unique species that can be easily recognized by the characters given in the description. It is obviously a member of the *cariniceps* group, but its relationship to other species is not clear. Some female specimens bear a vague resemblance to some specimens of *P. biovalis* Blackman, but this does not indicate a true relationship to that species.

*Pityophthorus euterpes*, n. sp.

Length 1.5–1.8 mm, 3.0–3.1 times longer than wide.

**MALE.**—Frons convex, bearing a very faint, longitudinal carina which extends from the weakly elevated epistoma to the upper eye level; surface shining, closely, deeply punctured, the punctures separated by a distance less than half their own diameters; vestiture inconspicuous. Antennal club 1.5 times longer than wide, widest through segment 2; sutures 1 and 2 transverse; segments 1 and 2 occupy about half the total club length.

Pronotum 1.2 times longer than wide, widest at about middle; sides weakly ar-

culate; anterior margin rather narrowly rounded, bearing about 10 separated serrations; asperities on anterior slope arranged into three distinct, concentric rows, two other indistinct concentric rows at summit, some of those in rows 1 and 2 slightly offset; summit distinctly but weakly elevated; posterior area strongly punctured, the punctures deep, moderately large, separated by a distance equal to about half or less of their diameters; interpuncture space brightly shining, smooth, with scattered fine points; median line broad, scarcely elevated.

Elytra 1.7 times longer than wide; apex broadly rounded, weakly produced at suture; discal striae punctured in regular rows, the punctures rather large, deeply impressed; discal interspaces weakly convex, about 1.5 times wider than striae, the surface shining, impunctate, very finely sculptured with fine lines and points. Declivity deeply sulcate; interspace 1 weakly elevated above 2, bearing a median row of fine setaceous granules; interspace 2 not wider than discal width, smooth to apex; interspace 3 abruptly elevated, much higher than 1, bearing about six prominent, acute granules along summit; punctures of striae 1 and 2 distinct, impressed, somewhat smaller than those on disc. Vestiture mostly confined to declivital region, the setae rather long, fine, and sparse.

**FEMALE.**—The form suspected to be the female is nearly identical to the male except declivital interspace 3 is much less strongly elevated with much finer granules.

**TYPE MATERIAL.**—The holotype (♂), and five paratypes were collected 21 miles (35 km) west of Lazaro Cardenas, Chiapas, Mexico, on 26 June 1969 from *Pinus oocarpa*, by D. E. Bright (CNC No. 15167). Three additional paratypes were collected at Lagos des Colores (Lagunas de Montebello National Park), Chiapas, Mexico, on 14 June 1969, by D. E. Bright, and one paratype is from Ocosingo Valley, Chiapas, Mexico, collected on 7 July 1960, by Stannard.

The holotype and most of the paratypes are in the CNC; additional paratypes are in the SLWC and the KESC.

**DISCUSSION.**—This species is closely related to *P. obtusipennis* Blandford, but the

adults of *P. euterpes* may be distinguished by their smaller, more slender body and by the finer granules on the declivital interspaces 1 and 3.

*Pityophthorus hesperius*, n. sp.

Length 2.1–2.3 mm, about 3.0 times longer than wide.

FEMALE.—Frons variable, varying from weakly, longitudinally sulcate in the median area, with the lateral elevations of the sulcus weakly to moderately elevated and spongy, to frons moderately protuberant in median area and spongy over entire surface; a small, laterally flattened tooth is usually located on epistoma of all forms; surface of remainder of frons moderately deeply punctured. Antennal club as in *concausus*.

Pronotum, elytra, and declivity as in *balsameus* and *concausus*.

MALE.—Frons flattened from epistoma to upper level of eyes, divided by a small, laterally flattened, distinct carina, the upper margin of flattened area elevated into a transverse, moderately to weakly elevated ridge; surface moderately punctured, shining. Pronotum and elytra as in *balsameus* and *concausus*. Declivity convex; median protuberances arising on interspace 3 pushed inward toward suture or appearing that each interspace 1 is pinched together.

TYPE MATERIAL.—The holotype (♀) is labeled: No. 74-1571-01, Date: 21-VIII-74, F.I.S. 1974/P. contorta, Hudson Hope, B.C./Holotype *Pityophthorus hesperius* D. E. Bright, 1977, (CNC No. 15491). The allotype bears the same data except the date is 3-IX-1974. Paratypes as follows: 3, same as holotype except dated 6-IX-1974; 5, same except dated 21-VIII-74; 1, same except dated 9-IX-1974; 1, same except dated 16-VIII-74; 1, Hixon, B.C., VII-9-1972, D. E. Bright/Pinus contorta; 1, Prince George, B.C., Pinus contorta/No. 72-1143-01, 14-XI-72, F.I.S. 1972; 4, Blackwater R., 21-VIII-57/57-7671-01, Pinus contorta and 1, 57-7672-02, Pinus contorta/158 Mile House, B.C., 15-VIII-57, F.I.S.

The holotype, allotype, and most of the paratypes are in the CNC. Additional paratypes are in the SLWC and the KESC.

REMARKS.—This species contains females

that resemble both *P. balsameus* Blackman and *P. concausus* Blackman. In the earlier stages of this study I considered it as a subspecies of *P. balsameus*. Wood (pers. comm.) was inclined to associate it with *P. concausus*. A reexamination of the series showed that forms resembling both species were present, even within populations from one locality. After careful consideration, I decided to treat it as a separate species. More collecting is needed, particularly in British Columbia, Alberta, and the adjacent regions to definitely establish its status.

*Pityophthorus impexus*, n. sp.

Length 1.9–2.1 mm, about 3.1 times longer than wide.

FEMALE.—Frons weakly convex on a large semicircular area extending from epistomal margin to well above upper level of eyes and laterally nearly from eye to eye; surface shining, bearing large, deep punctures on periphery, these becoming smaller toward middle, median portion weakly flattened and impunctate on a small area just above epistomal margin; vestiture rather sparse, consisting of long, erect setae scattered over the surface, those on periphery somewhat longer and incurved. Antennal club large, about 1.2 times longer than wide, widest through segment 3; segment 1 small, narrower than 2 or 3; suture 1 weakly arcuate, 2 more strongly so; segments 1 and 2 occupy less than half the total club length.

Pronotum 1.1 times or less longer than wide; sides weakly arcuate on basal half; anterior margin broadly rounded, bearing about 6 to 8 distinct serrations, these gradually increasing in size toward middle; asperities on anterior slope moderately large, erect, usually isolated but 2 or 3 occasionally basally contiguous; summit distinct, high; posterior portion densely punctured, the punctures large and deeply impressed, separated by a distance equal to about half their diameters; interpuncture surface moderately shining, rather densely microreticulate; median line broad, not elevated, narrowed just behind summit.

Elytra 1.7 times longer than wide; apex broadly rounded; striae punctured in regular



rows, the punctures about equal in size to those on posterior portion of pronotum, rather deeply impressed; discal interspaces about 1.0 to 1.5 times wider than striae, impunctate (except 1), surface moderately shining, densely microreticulate. Declivity convex, somewhat flattened between the third interspaces; interspace 1 equal in width to its discal width, slightly elevated, bearing a median row of very fine granules and short setae; interspace 2 flat, as wide as discal width, very weakly impressed below level of 1 and 3; interspace 3 very weakly elevated, equal in height to 1, bearing a median row of fine granules and long setae, the granules slightly larger than those in 1, and the setae much longer; remaining alternate interspaces bear long setae on posterior third (or less) of elytra; punctures in striae 1 and 2 distinct, smaller than those on disc.

MALE.—Frons convex, narrowly, transversely impressed just above epistoma; this impression divided by a median, longitudinal, laterally flattened, small tooth; surface of frons rather densely pubescent and deeply, closely punctured, the punctures smaller and finer in transverse impression. Pronotum as in female except asperities and serrations larger. Elytra essentially as in female.

TYPE MATERIAL.—The holotype (♀), allotype, and nine paratypes were collected 6 miles (10 km) south of Carapan, Michoacan, Mexico on 18 June 1965 from *Pinus* sp., by S. L. Wood. Five additional paratypes were collected 3 miles (5 km) west of El Salto, Durango, Mexico, on 17 June 1965 from twigs of *Pinus ayacahuite* by S. L. Wood, and two paratypes were collected by R. Coronado P. at Tequesquinahua, Mexico, Mexico, on 2 March 1962, from twigs of a *Pinus* sp.

The holotype, allotype, and most of the paratypes are in the SLWC. A pair of paratypes is in the CNC (No. 15480).

REMARKS.—Adults of this species resemble closely those of *P. segnis* Blackman and *P. subopacus* Blackman. The adults of *P. impexus* differ from the latter species by the more flattened, more weakly impressed elytral declivity, especially between the third interspaces of each elytron, by the more densely pubescent male frons and the

more sharply elevated longitudinal carina and by the more extensive pubescent area on the female frons.

*Pityophthorus intentus*, n. sp.

Length 1.5–1.8 mm, about 2.8 times longer than wide.

FEMALE.—Frons weakly convex, flattened or weakly, transversely impressed from epistoma to near upper level of eyes, with a weak, longitudinal carina which extends from the epistoma to upper level of eyes, ending at a weakly elevated, impunctate, median elevation; surface deeply, densely punctured, the punctures rather large and close, almost touching; vestiture sparse, scattered and inconspicuous. Antennal club small, oval, about 1.4 times longer than wide; sutures 1 and 2 straight; segments 1 and 2 occupy more than half the total club length.

Pronotum 1.1 times longer than wide; sides nearly straight, parallel on basal half; anterior margin broadly rounded, bearing about a dozen very low, basally contiguous serrations; asperities on anterior slope erect, low, generally isolated and arranged in no apparent order; summit distinct; posterior portion finely punctured, the punctures shallow, small, and usually separated by distances greater than their diameters; interpuncture space brightly shining, generally smooth but usually bearing a few very minute points or lines; median line narrow, not clearly evident.

Elytra about 1.9 times longer than wide; apex strongly acuminate; striae punctured in regular rows, the punctures much larger than those on posterior portion of pronotum, deeply impressed; discal interspaces about as wide as striae or slightly narrower, surface moderately shining, with scattered fine points and lines. Declivity bisulcate; interspace 1 narrowly, strongly elevated, equal in height to 3, bearing a median row of about four widely separated, acute granules and erect, stout setae; interspace 2 deeply sulcate, distinctly wider than discal width, smooth and shining; interspace 3 distinctly elevated and bearing a median row of about four widely separated, acute granules, these equal in size to those on inter-

space 1; punctures in striae 1 and 2 obsolete.

MALE.—Frons almost identical to female except median transverse elevation stronger, longitudinal carina slightly more evident and punctures on surface slightly stronger. Pronotum and elytra as in female except elytral apex less strongly acuminate. Declivity essentially as in female except interspace 2 slightly less deeply impressed and interstitial setae stouter.

TYPE MATERIAL.—The holotype (♀), allotype, and 11 paratypes were collected in Bear Canyon, Santa Catalina Mountains, Arizona, on 15 August 1968, from twigs of *Pinus ponderosa*, by D. E. Bright (CNC No. 15481). Five additional paratypes are from the Santa Rita Mountains, Santa Cruz Co., Arizona, collected on 29 July 1968, from *Pinus strobiformis* (1) and *Pseudotsuga menziesii* (4), by D. E. Bright.

The holotype, allotype, and most of the paratypes are in the CNC; additional paratypes are in the SLWC and the KESC.

REMARKS.—Adults of *P. intentus* resemble those of *P. consimilis* LeConte but differ in a number of points. On adults of *P. intentus*, the second declivital interspace is more deeply sulcate, the granules on declivital interspaces 1 and 3 are much larger, the punctures on the frons of both sexes are larger and deeper, and the longitudinal carina and the transverse elevation are much more prominent. In addition, *P. consimilis* occurs in conifers in eastern North America, and *P. intentus* occurs in conifers in the southwestern United States.

*Pityophthorus laticeps*, n. sp.

Length 2.5 mm about 2.9 times longer than wide.

MALE.—Frons flattened from epistoma to well above eyes, very weakly impressed in median portion, divided by a prominent but weakly elevated longitudinal carina which extends from epistomal margin to well above upper level of eyes; surface moderately shining, rather strongly punctured, the punctures distinctly impressed, close, separated by a distance equal to or less than their diameters; vestiture short but conspicuous and abundant. Antennal club

oval, 1.3 times longer than wide; sutures 1 and 2 very weakly arcuate; segments 1 and 2 occupy more than half the total club length.

Pronotum 1.1 times longer than wide, widest at about middle; sides weakly arcuate; anterior margin broadly rounded, with about 10 contiguous, rather large serrations; asperities on anterior slope erect, rather large, isolated, scattered in no readily apparent order; summit distinct; posterior area distinctly punctured, the punctures of moderate size, usually separated by a distance more than their own diameters; inter-puncture space moderately shining, with numerous very fine micropoints; median line broad, impunctate.

Elytra 1.6 to 1.7 times longer than wide; apex broadly rounded; discal striae punctured in regular rows, the punctures large, almost touching, deeply impressed; discal interspaces about 2.0 times wider than striae, surface brightly shining, densely micropunctate and subrugulose, interspaces 1, 3, 5, 7, and 9 each bearing on disc a median row of about 3 to 4 larger setose punctures, these punctures as large and deep as those in striae, the setae arising from these punctures rather long and stout. Declivity broadly flattened between the fourth interspaces; interspace 1 rather deeply impressed below level of 3 on upper half, slightly elevated above surface at apex, bearing a median row of very fine granules and short setae; interspace 2 broadly sulcate, slightly wider than discal width, bearing 2 or 3 very small, acute granules at top; interspace 3 weakly elevated on upper half, bearing about 5 rounded granules on the upper portion and 1 or 2 more at apex, each granule bearing a moderately long, stout seta; interspaces 4 and 5 smooth, bearing a median row of fine setae; punctures of striae 1 large, not impressed, those in striae 2 much smaller in median area of declivital face than those on disc, those at apex nearly as large as those on disc.

FEMALE.—Not definitely recognized in material at hand. A female bearing the identical data and apparently associated with the male has the following characteristics: Frons broadly flattened on a large semicircular area, densely pubescent, with



the peripheral setae longer and incurved. Pronotum essentially as in male holotype except interpuncture spaces on posterior portion are more densely micro-punctate/reticulate and the large punctures are larger and deeper. Elytra essentially as in male except striaal punctures slightly smaller and shallower. Declivity completely different from male, convex, not flattened; interspace 1 slightly impressed below level of 3, bearing a median row of fine granules; interspace 2 weakly, not broadly sulcate, only slightly wider than discal width; interspace 3 weakly elevated, distinctly higher than 1, bearing a median row of moderately large, rounded, setose granules; striaal punctures as in male holotype.

**TYPE MATERIAL.**—The holotype ( $\delta$ ) was collected 20.5 km. north of Oaxaca, Oaxaca, Mexico, at an elevation of 9000 feet, on 6 June 1971, from *Pinus* sp., by D. E. Bright (CNC No. 15482). The female specimen described above bears the same data but is not designated as an allotype.

**REMARKS.**—Males of this species are readily distinguished by the broadly flattened elytral declivity in which interspace 3 is near the middle of the declivital face and is granulate only on the upper half and again at the apex, and by the finely punctured posterior half of the pronotum which, in the interpuncture spaces, bears dense, fine micropoints.

The female associated with the male specimen resembles the male in several features but I have doubts that it is the actual female of this species. Until more specimens are available, the female must remain doubtful.

*Pityophthorus malleatus*, n. sp.

Length 1.9–2.2 mm, about 2.9 times longer than wide.

**FEMALE.**—Frons flattened from epistoma to above upper level of eye and laterally occupying about 73 percent of distance between eyes; surface of flattened area densely, moderately, and somewhat roughly punctured except on a small, median area just above epistomal margin, and clothed with sparse, moderately long, fine setae, those on periphery of flattened area slightly

longer and incurved; surface lateral to and above flattened area smooth, with large, deep, widely separated punctures. Antennal club oval, 1.4 times longer than wide; sutures 1 and 2 transverse; segments 1 and 2 occupy slightly more than half the total club length.

Pronotum about 1.2 times longer than wide; widest just before level of summit; sides straight, parallel on basal half; anterior margin broadly rounded, bearing about 10 or more, broad, prominent, basally contiguous serrations; asperities on anterior slope rather large and distinct, scattered in no apparent order; summit distinct; posterior portion moderately strongly punctured, the punctures rather large, deep and usually separated by a distance greater than their diameters; interpuncture space brightly shining, smooth, with numerous, minute points.

Elytra about 1.7 times longer than wide; apex broadly rounded; striae punctured in even, regular rows, the punctures quite large and deeply impressed; discal interspaces about 2.0 times wider than striae, surface brightly shining, smooth, impunctate and usually with numerous, scattered, very minute points. Declivity steep and weakly, broadly bisulcate; interspace 1 moderately elevated, surface more opaque than on disc, bearing a median row of about four widely separated granules; interspace 2 moderately sulcate, distinctly wider than discal width, surface dull, opaque, marked with numerous fine lines; interspace 3 moderately elevated, about equal in height to 1, bearing about four or more widely separated granules, these granules about equal in size to those on interspace 1; punctures in striae 1 and 2 obsolete; setae on interspaces 1 and 3 slender, moderately long.

**MALE.**—Frons shallowly, transversely impressed, upper margin of impression bearing a distinct, arcuate, transverse carina; surface below carina densely, deeply punctured except on a very weakly indicated, longitudinal carina; surface above transverse carina more deeply punctured. Antennal club as in female. Pronotum and elytra essentially as in female except sculpturing slightly stronger. Declivity as in female except interspace 2 more deeply impressed, interspace 3 more

abruptly elevated, granules on interspaces 1 and 3 slightly larger and setae on interspaces 1 and 3 stouter.

TYPE MATERIAL.—The holotype (♀), allotype, and 6 paratypes were collected at Walker, Yavapai County, Arizona, on 23 August 1968, from twigs of *Pseudotsuga menziesii*, by D. E. Bright (CNC No. 15483).

The holotype, allotype, and four paratypes are in the CNC and two paratypes are in the SLWC.

REMARKS.—Adults of this species closely resemble those of *P. pseudotsugae* Swaine, but the elytral interspaces of *P. malleatus* are completely impunctate while in *P. pseudotsugae* they bear at least a few setose punctures. In addition, the male frons of *P. malleatus* is less deeply impressed and the setae on the female frons are much sparser and shorter.

In declivital characters, adults of *P. malleatus* also resemble those of *P. intextus* Swaine and *P. cascoensis* Blackman. Females and males of *P. malleatus* differ in the characteristics of the frons and by the impunctate elytral interspaces.

*Pityophthorus mesembria*, n. sp.

Length 2.0–2.2 mm, about 2.8 times longer than wide.

FEMALE.—Frons flattened on a large semicircular area extending from epistomal margin to well above eyes and laterally occupying over 80 percent of distance between eyes; surface shining, moderately densely punctured, largely concealed by the long, incurved setae which extend from periphery of flattened area almost to epistomal margin, setae on remainder of flattened area very short, erect. Antennal club oval, about 1.3 times longer than wide, widest through segment 2; sutures 1 and 2 transverse, rather heavily chitinized at lateral margins; segments 1 and 2 occupy more than half the total club length.

Pronotum 1.1 times longer than wide, widest on posterior half; sides moderately to rather strongly arcuate; anterior margin narrowly rounded, bearing 10 or more erect, basally contiguous serrations of moderate size; asperities on anterior slope erect, usu-

ally isolated but some may be basally contiguous, scattered in no apparent order; summit prominent; transverse impression behind summit distinctly impressed, divided by the distinct, narrowly elevated median line; posterior area strongly punctured, the punctures of moderate size, deeply impressed, separated by a distance equal to or less than their diameters; interpuncture space brightly shining, with numerous fine points.

Elytra 1.6–1.7 times longer than wide; apex moderately acuminate; discal striae punctured in regular rows, the punctures slightly larger than those on posterior portion of pronotum and more deeply impressed, each puncture bearing a very short, recumbent seta; discal interspaces 1.5–2.0 times wider than striae, surface shining, impunctate, smooth with numerous very fine lines and/or points. Declivity shallowly bisulcate; interspace 1 weakly elevated, bearing a median row of 10 or more small, rounded granules, each of these with a longer, erect, moderately stout seta arising from posterior margin; interspace 2 wider than its discal width, shallowly impressed, surface shining, with numerous, scattered, fine points and lines; interspaces 3 slightly elevated, higher than 1, bearing a median row of 8–10 fine, rounded granules, each of these with a stout, erect seta as those on interspace 1; punctures in striae 1 and 2 visible but smaller and less deeply impressed than those on disc.

MALE.—Frons flattened on a semicircular area as in female, punctures on this area very large, deep and close; a weakly elevated median, longitudinal carina extends from epistoma to upper level of eyes; vestiture moderately long, sparse, and relatively inconspicuous. Pronotum as in female except asperities larger and the points in the interpuncture spaces on the posterior portion of the pronotum deeper and more conspicuous, resulting in the large punctures becoming more obscure. Elytra as in female except striae punctures deeper. Declivity as in female except granules on interspaces 1 and 3 larger.

TYPE MATERIAL.—The holotype (♀), allotype, and five paratypes were collected on Cerro Calcl, Quezaltenango, Guatemala, at

an elevation of 10,000 feet, on 26 May 1964, from *Abies guatemalensis*, by S. L. Wood.

The holotype, allotype, and three paratypes are in the SLWC; one pair of paratypes is in the CNC (No. 15484).

REMARKS.—Adults of this species are distinguished from other species in the *confer-tus* group by the arcuate pronotal sides, by the densely punctured interpuncture space on the posterior portion of the pronotum, by the presence of numerous granules on declivital interspaces 1 and 3, by the host, and by the distribution.

*Pityophthorus montezumae*, n. sp.

Length 2.5–2.9 mm, about 2.5–2.6 times longer than wide.

FEMALE.—Frons flattened on a broad area extending from the epistoma to well above upper eye level and laterally nearly from eye to eye, central portion of flattened area frequently concave; surface moderately shining, densely, finely punctured and marked with numerous fine lines and points; vestiture abundant, those setae in central area short and erect, those on periphery much longer and incurved. Antennal club very large, broad, about 1.1 times longer than wide, widest through segment 3; sutures 1 and 2 distinctly arcuate; segment 1 small, much narrower than 2 or 3; segments 1 and 2 together occupy less than half the total club length.

Pronotum as long as wide, widest on posterior one-quarter; sides weakly arcuate to weakly converging; anterior margin broadly rounded, bearing about 10 low, contiguous serrations; asperities on anterior slope numerous, low, broad, densely scattered in no apparent order; summit distinct; transverse impression behind summit moderately impressed; posterior area densely punctured, the punctures moderately deeply impressed and separated by a distance equal to slightly less than their diameters, the lateral margins of some punctures weakly elevated, giving a weakly, subasperate appearance to the surface, especially on lateral areas; interpuncture space dull, finely, minutely reticulate; median line broad, not elevated, impunctate.

Elytra 1.6–1.7 times longer than wide; apex broadly rounded; discal striae punctured in regular rows, the punctures very large, moderately deep and separated by a distance equal to less than half their diameters; discal interspaces narrower than or equal in width to striae, surface moderately dull, densely, minutely reticulate, each interspace with a median row of large punctures equal in size to those in striae, each of these bearing a moderately long, erect seta, the setae longer on posterior portions of each interspace. Declivity convex, moderately bisulcate; interspace 1 moderately elevated, equal in height to 3 or very slightly lower, bearing a median row of about six widely separated, fine granules, each granule with a long, erect seta arising from lower edge; interspace 2 moderately sulcate, equal in width or slightly wider than discal width, surface as on disc; interspace 3 weakly elevated, bearing a median row of about six or less small granules, these slightly larger than those on interspace 1 and each bearing a long erect seta on lower edge; punctures of striae 1 and 2 obsolete.

MALE.—Frons flattened to very weakly impressed on each side of a sharply elevated, longitudinal carina extending from epistomal margin to upper level of eyes, this carina more strongly elevated on lower half and sometimes nearly toothlike; surface on each side of carina dull, densely punctured, and with numerous moderately long setae. Pronotum and elytra essentially as in female. Declivity as in female except granules on interspaces 1 and 3 slightly larger.

TYPE MATERIAL.—The holotype (♀), allotype, and 22 paratypes were collected 7 miles (11.5 km) east of San Cristobal (de las Casas), Chiapas, on 13 May 1969, from twigs of *Pinus montezumae*, by D. E. Bright (CNC No. 15485). One additional paratype is from 4 miles (6.5 km) east of San Cristobal, Chiapas, collected on 26 May 1969, from *Pinus* sp., by D. E. Bright.

The holotype, allotype, and most of the paratypes are in the CNC. Additional paratypes are in the SLWC and the KESC.

REMARKS.—Adults of this species show many of the characteristics of the *blandus* group except for the remarkable antennal club and the more distinctly elevated carina



on the male frons. Adults are easily recognized by the very large, broad, antennal club with the narrow first segment and the strongly arcuate sutures, by the sharply elevated but not toothlike carina on the male frons, by the first and third declivital interspaces being nearly equal in height, and by the distribution. This is the only species in this group that occurs south of the Isthmus of Tehuantepec.

*Pityophthorus scalptus*, n. sp.

Length 2.6–3.0 mm, about 2.7 times longer than wide.

FEMALE.—Frons broadly flattened from eye to eye and from epistoma to well above eyes, slightly but distinctly concave on an almost circular, broad, median area; surface moderately shining, with close, deep, moderately large punctures, and bearing short, erect setae over most of the area, the setae on the periphery being much longer, coarser, and incurved. Antennal club oval, about 1.3 times longer than wide, widest through segment 3; suture 1 nearly transverse, 2 weakly arcuate; segments 1 and 2 occupy less than half the total club length.

Pronotum as long as wide, widest on posterior half; sides moderately arcuate; anterior margin broadly rounded, with about 10 prominent, basally contiguous serrations, the median pair usually quite large and erect; asperities on anterior slope generally large and erect, usually isolated but several may be basally contiguous, scattered in no apparent order; summit distinct; posterior area deeply, closely punctured, the punctures of moderate size, separated by a distance about equal to their diameters, the lateral margin of each puncture elevated into a distinct granule, giving a definite granulate appearance to the posterior surface, these granules usually larger and more distinct posteriorly and laterally to the summit; inter-puncture space moderately shining to dull, bearing minute points or minute reticulations; median line broad, surface smooth, impunctate and usually shining.

Elytra 1.5–1.6 times longer than wide; apex broadly rounded; discal striae punctured in regular rows, the punctures small, deep and close, each bearing a minute,

erect seta; discal interspaces 2–3 times wider than striae, surface moderately shining, microrugulose or smooth, with numerous fine points and microreticulation; interspaces 1, 3, 5, and 7 each with a few scattered, median punctures, each of which bears a minute, erect seta, each seta equal in length to those in striae. Declivity broadly convex, weakly impressed; interspace 1 narrowly elevated, weakly impressed below level of 3, bearing a median row of close, fine granules; interspace 2 flat, about as wide as on disc, surface as on disc; interspace 3 not elevated, bearing a median row of extremely fine granules; interspace 9 weakly elevated, joining interspace 3 near elytral apex; punctures in striae 1 and 2 distinct, much smaller than those on disc, striae 1 moderately, narrowly impressed.

MALE.—Frons broadly, shallowly impressed below upper level of eyes, with a distinct, longitudinal carina extending from the epistoma to above upper eye level; surface moderately shining, densely, closely punctured. Antennal club narrower than in female. Pronotum and elytra essentially as in female. Declivity essentially as in female except interspace 3 very slightly elevated, granules in interspaces 1 and 3 slightly larger, and junction of interspace 3 and 9 slightly more distinct.

TYPE MATERIAL.—The holotype (♀), allotype, and 142 paratypes were collected at Aspen Grove, British Columbia, from *Pinus ponderosa*, by H. Richmond on various dates during July 1931 (CNC No. 15486). Two additional paratypes were collected at Estes Park, Colorado, on 31 August 1938 from *Pinus ponderosa* (Hopk. US 31541-V). Four additional specimens, not designated as paratypes, are from Stevensville, Montana, collected on 31 August 1967, from *Pinus ponderosa*, by R. McEwan and M. McGregor (Hopk. US 51945) (USNM).

The holotype, allotype, and 10 paratypes are in the CNC, 10 paratypes are in the SLWC, two are in the KESC, two in the USNM, and the remainder are in the CASC and in the University of British Columbia, Vancouver.

REMARKS.—This species is very closely related to *P. scalptor* Blackman. The most obvious and easily seen character which will

distinguish the two species is the presence of prominent granules on the posterior portion of the pronotum of adults of *P. scalptus* vs. the absence of granules on adults of *P. scalptor*. Other less obvious differences that distinguish adults of *P. scalptus* are the larger and deeper punctures on the female frons, the slightly lower carina on the male frons, and the slightly smaller size of the antennal club.

*Pityophthorus trepidus*, n. sp.

Length 1.6–2.0 mm, about 2.7 times longer than wide.

FEMALE.—Frons generally flattened from well above eyes to epistomal margin and from eye to eye, very weakly transversely impressed at midlevel; sometimes a very weak, longitudinal carina is present; surface densely, closely punctured, the punctures deep, distinct, separated by a distance equal to less than their diameters, surface between punctures smooth, shining; vestiture scattered, consisting of moderately long, erect setae. Antennal club oval, about 1.4 times longer than wide, widest through segment 2; sutures 1 and 2 arcuate, 1 slightly more than 2; segments 1 and 2 occupy more than half the total club length.

Pronotum about as long as wide, widest just behind middle; sides broadly arcuate; anterior margin broadly rounded, bearing about a dozen, basally contiguous, erect serrations; asperities on anterior slope erect, of moderate size, scattered in no apparent order; summit distinctly elevated, transverse impression behind summit weak; posterior portion deeply, densely punctured, the punctures rather large, separated by distances equal to less than their diameters; interpuncture space brightly shining, smooth.

Elytra about 1.8 times longer than wide; apex broadly rounded; discal striae punctured in regular rows, the punctures shallow and indistinct, somewhat obscured by the microrugulose sculpturing of surface, each puncture bearing a very short, erect seta; discal interspaces about 2.0 times wider than striae, surface roughened by microrugulose sculpturing, interspaces 1, 3, 5, 7, etc., each bearing a few, scattered, median punctures, each of which bears a very short,

erect seta, these setae equal in length to those arising from striae punctures or only slightly longer. Declivity convex, weakly impressed along suture; interspace 1 narrow, bearing a median row of extremely minute granules; interspace 2 wider than discal width, otherwise as on disc; interspace 3 essentially as on disc, bearing a few, very fine granules; punctures in striae 1 and 2 obsolete, striae 1 narrowly, weakly impressed.

MALE.—Almost identical to female except longitudinal carina on frons may be more evident. Distinguishable with certainty only by abdominal segmentation.

TYPE MATERIAL.—The holotype (♀), allotype, and nine paratypes were collected at Ukiah, California, from *Pinus radiata*, under Hopkins No. 20976. No date or collector is indicated on the specimens.

The holotype, allotype, and five paratypes are in the USNM. Two paratypes each are in the CNC (No. 15487) and the SLWC.

REMARKS.—This species is closely related to *P. keeni* (Blackman), but the adults of *P. trepidus* can be distinguished by the very short interstitial setae (equal in length to the striae setae) and by striae 1 being weakly impressed on the declivity. The host relationships also are different, because *P. keeni* is found in various species of pinyon pines in the west and *P. trepidus* is known from *Pinus radiata*, a tree restricted to the coastal and island forests of central southern California.

*Pityophthorus vespertinus*, n. sp.

Length 1.9–2.0 mm, 2.4–2.5 times longer than wide.

FEMALE.—Frons weakly flattened on a semicircular area extending from epistoma to slightly above upper level of eyes; surface shining, densely, minutely punctured, and clothed with erect, moderately long, yellowish setae. Antennal club nearly circular, widest through segment 3; segment 1 distinctly narrower than others; sutures 1 and 2 arcuate, 2 more strongly so; segments 1 and 2 occupy slightly less than half the total club length.

Pronotum about 1.1 times longer than

wide, widest at posterior angles; sides broadly, weakly arcuate; anterior margin broadly rounded, bearing about 10 small to large serrations, these very low and broad laterally, gradually increasing in size toward middle; asperities on anterior slope small, erect, scattered in no apparent order; summit prominent; posterior area bearing large, shallow, close punctures, these separated by a distance equal to or slightly less than their diameters; interpuncture space dull, densely, minutely reticulate; median line impunctate, weakly elevated.

Elytra about 1.6 times longer than wide; apex broadly rounded; discal striae punctured in fairly regular rows, the punctures rather large, deep and close; discal interspaces about 1.5–2.0 times wider than striae, generally impunctate but sometimes bearing a few, widely separated punctures, surface opaque, densely, minutely reticulate. Declivity convex, very weakly impressed; interspace 1 weakly elevated, with a median row of fine granules; interspace 2 as wide as discal width, weakly impressed; interspace 3 weakly elevated, about equal in height to 1, bearing a median row of fine granules; punctures in striae 1 and 2 distinct, nearly equal in size and depth to those on disc.

MALE.—Frons weakly concave or flattened on each side of a distinctly elevated, longitudinal carina which extends from epistomal margin to near upper level of eyes; surface on each side of carina densely punctured, the punctures large and shallow. Otherwise similar to female.

TYPE MATERIAL.—The holotype (♀), allotype, and two paratypes were collected 23 miles (35 km) west of Durango, Durango, Mexico, 6000 feet in elevation, on 4 June 1965, from twigs of *Pinus* sp., by S. L. Wood.

The holotype, allotype, and one paratype

are in the SLWC; one paratype is in the CNC (No. 15488).

REMARKS.—This species is very closely related to *P. diglyphus* Blandford and may eventually prove to be a subspecies or may even be the same species. This species is only known from Durango, Mexico, and *P. diglyphus* is known from quite a few localities in southern Mexico and Guatemala. Because of the wide geographical separation and the morphological differences, I have described *P. vespertinus* as a distinct species.

Adults of *P. vespertinus* are distinguished from those of *P. diglyphus* by the less strongly elevated carina on the male frons, by the less strongly elevated third and ninth elytral interspaces, by the nearly circular antennal club, and by the more northerly distribution.

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